Programmatic Risk – Completing the Enterprise Picture

Enterprise Risk Management Workshop

January 14 & 15, 2004

National Academies of Science, Engineering, & Medicine

Washington, DC

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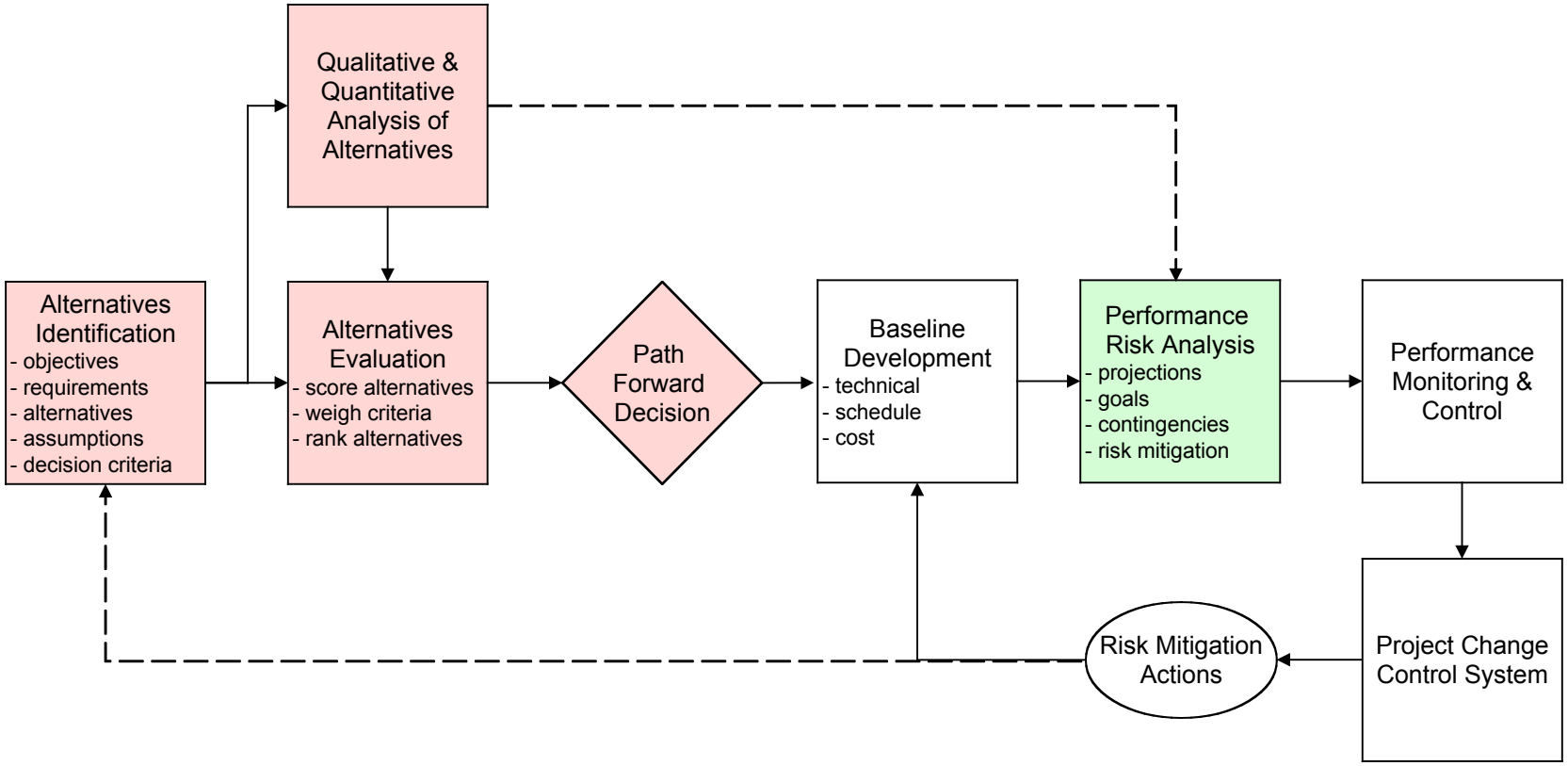
Programmatic Risk

- Uncertainty in predicted performance for a program or project
- Extends beyond "operational" sources of risk to include programmatic/ strategic decision making risks

Programmatic and Operational Risk

"WHAT SHOULD WE DO?" **"HOW DO WE GET IT DONE?"**



Why be Concerned with Programmatic Risk?

- Many carefully considered endeavors have failed to produce the desired results.
  - Iridum Communications System
  - Hanford Clean-Up
  - Most US Nuclear Power Plants
  - Space Shuttle
  - Edsel
- Pending decisions
  - Boeing 7E7
  - Hydrogen fueled transportation
  - “New” nuclear weapons

Why be Concerned with Programmatic Risk? (cont.)

Research Results for Project Failure Likelihood

Project Outcome Categories		Likelihood (%)			
		Nuclear Power after TMI (1)	Information Technologies (2)	Process Industries (3)	Your Business?
I	Success	0%	26%	33%	
II	Completed but one or more major objectives not met	60%	46%	67%	
III	Total failure / not completed	40%	28%	N/A	

1) Kindinger, JP, (1985) *Analysis of Lead Times and Causes of Delays in U.S. Nuclear Power Plant Projects since 1980*, Masters Thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA.
2) Howard, RM, (1997), *The Business Stake in Effective Project Systems*, The Business Roundtable
3) The Standish Group, (1995), Chaos

Challenges in Measuring Programmatic Risk

- Risk Identification
  - Completeness
  - Integration of Varied Sources
  - Independence
- Data Availability
  - Little applicable historical data
  - Applicability of subjective data

Measuring Techniques - Qualitative

- Methods
  - Multi Criteria Decision Making
  - Risk Factor Analysis
  - Risk matrix
- Results
  - Relative ranking of alternatives/risks
  - Bases for quantitative analysis input distributions

Measuring Techniques - Quantitative

- Methods
  - Scenario tree analysis
  - Discrete event simulation
  - Dynamic event simulation
  - Resource Allocation Analysis
- Results
  - Performance, with uncertainty, for the total program/project
  - Identification of important contributors to uncertainty in performance
  - Identification of potential risk reduction actions
  - Identification of key boundary conditions

How Much Data is Enough?

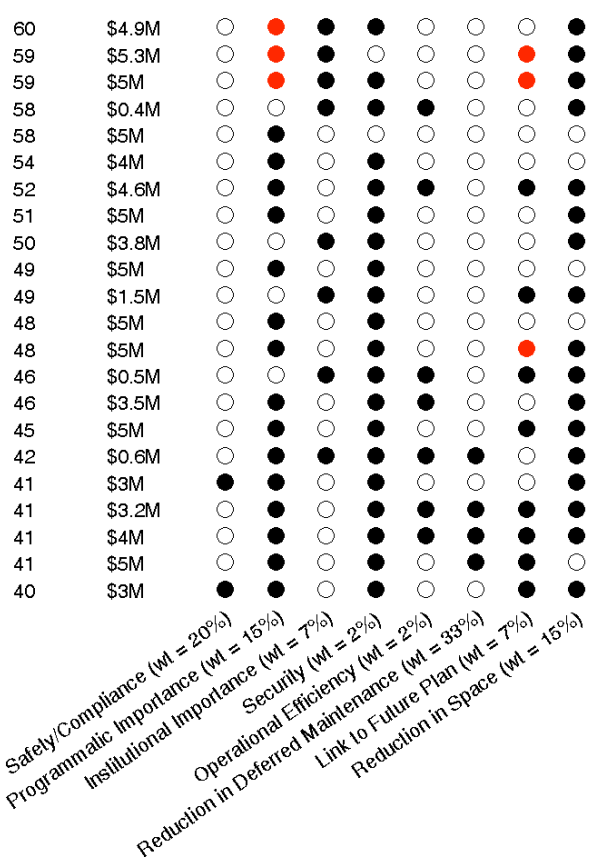
- An inappropriate question
- Uncertainty (risk) in performance exists. Refusal to acknowledge it does not make it go away.
- The greater the uncertainty, the greater the need for risk analysis!

Backup Slides

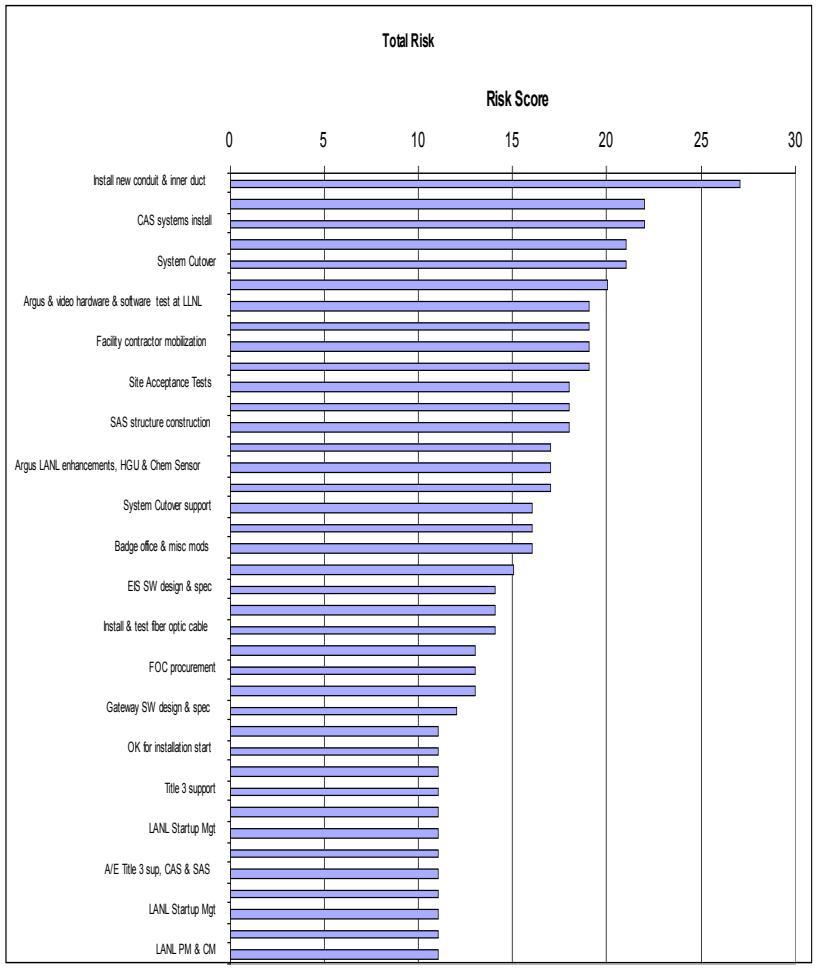
Example Multi Criteria Decision Results

FY04 FIRP Prioritization - 1

Proposal	Score	Cost
ESA-TSE: WETF Urgent Maintenance	60	$4.9M
ESA-CON: TA-16-193 Reconfiguration	59	$5.3M
DX: Shock & Detonation Physics Facility	59	$5M
FWO-WFM: TA-50-1 Stem Wall Repair	58	$0.4M
S: Plans & Programs Office	58	$5M
P: Quantum Institute for Research	54	$4M
C: Replace High Voltage Electrical Panels in TA-48 RC-1	52	$4.6M
HSR: TA-59, OH-2 Replacement plus OH Transportables	51	$5M
LANSCE: Ventilation and Cooling Upgrade, Lujan Center	50	$3.8M
C: C-Div Office Building	49	$5M
FWO-CMR: CMR Steam Reducing Stations	49	$1.5M
EES: EES Pajarito Corridor Relocation & Failed Structur	48	$5M
NIS: Nonproliferation & International Security Center A	48	$5M
FWO-NIS: TA-18 Lightning Protection Upgrades	46	$0.5M
NIS: TA-33 Sanitary Sewer System Replacement	46	$3.5M
RRES: RRES Division Consolidation	45	$5M
B: Removal and Disposal of Cobalt 60 Source	42	$0.6M
HSR: Health Physics Measurements Consolidation	41	$3M
RRES-Inst: Contaminated Drains Maintenance Project - 2	41	$3.2M
RRES-Inst: Contaminated Drains Maintenance Project - 1	41	$4M
CCN: Desktop Operations and Coordination Facility	41	$5M
MST: TA-03-32 & 34 Revitalization	40	$3M

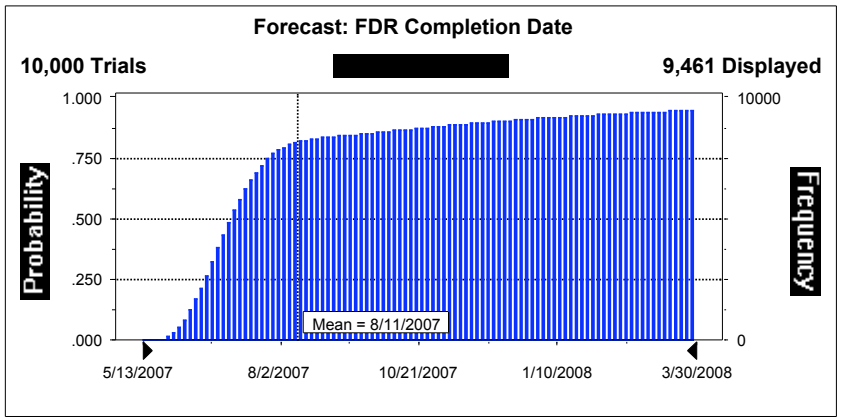


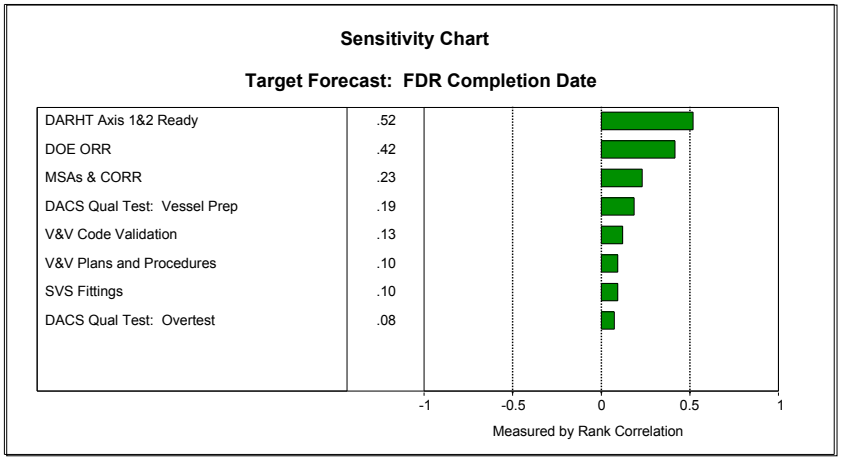
Example Risk Factor Analysis Results



- Risk rankings for each risk factor are documented for each task and summed for technical, schedule, cost and total risk.
- The RFA process identifies possible risk reduction actions and provides the basis for schedule & cost distribution development

Example Quantitative Risk Analysis Result





Percentile	Value
0%	5/13/0
5%	6/4/0
10%	6/9/0
15%	6/13/0
20%	6/17/0
25%	6/20/0
30%	6/23/0
35%	6/26/0
40%	6/29/0
Target	6/30/0
45%	7/1/0
50%	7/5/0
55%	7/8/0
60%	7/12/0
65%	7/16/0
70%	7/21/0
75%	7/27/0
80%	8/6/0
Mean	8/11/0
Commitment	9/15/0
85%	9/20/0
90%	12/8/0
95%	4/15/0
100%	6/26/0